

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A high pressure chamber for processing of a semiconductor substrate comprising:

- a. a chamber housing comprising a first sealing surface;
- b. a platen comprising a region for holding the semiconductor substrate and a second sealing surface; [[and]]
- c. a single mechanical drive mechanism having a single pressure source for forming and maintaining a wafer cavity for containing the semiconductor substrate during high pressure processing, the single mechanical drive mechanism coupling the platen to the chamber housing such that in operation the single mechanical drive mechanism separates the platen from the chamber housing for loading of the semiconductor substrate and further such that in operation the said single mechanical drive mechanism causes the second sealing surface of the platen and the first sealing surface of the chamber housing to contact, thus forming the wafer cavity and maintaining the wafer cavity during high pressure processing; and
- d. a circulation loop coupled to the wafer cavity and configured to maintain a supercritical fluid and circulate the supercritical fluid through the wafer cavity.

Claim 2 (original): The high pressure chamber of claim 1 wherein the first sealing surface of the chamber housing comprises an o-ring groove.

Claim 3 (original): The high pressure chamber of claim 2 further comprising an o-ring within the o-ring groove.

Claim 4 (original): The high pressure chamber of claim 1 wherein the second sealing surface of the platen comprises an o-ring groove.

Claim 5 (original): The high pressure chamber of claim 4 further comprising an o-ring within the o-ring groove.

Claim 6 (original): The high pressure chamber of claim 1 wherein the first sealing surface of the chamber housing seals to a spacer and further wherein the second sealing surface of the platen seals to the spacer.

Claim 7 (previously presented): The high pressure chamber of claim 1 wherein the single mechanical drive mechanism comprises a piston driven by a fluid.

Claim 8 (original): The high pressure chamber of claim 7 wherein the fluid comprises an incompressible fluid.

Claim 9 (original): The high pressure chamber of claim 7 wherein the fluid comprises a compressible fluid.

Claim 10 (previously presented): The high pressure chamber of claim 1 wherein the single mechanical drive mechanism comprises an electro-mechanical drive mechanism.

Claim 11 (previously presented): The high pressure chamber of claim 10 wherein the electro-mechanical drive mechanism comprises a linear actuator.

Claim 12 (original): The high pressure chamber of claim 11 wherein the linear actuator comprises a drive screw.

Claim 13 (currently amended): A high pressure chamber for processing a semiconductor substrate comprising:

- a. a chamber housing comprising a first sealing surface;
- b. a platen comprising a second sealing surface and a region for holding the semiconductor substrate;
- c. a single mechanical drive mechanism having a single pressure source for forming a wafer cavity for containing the semiconductor substrate, the single mechanical drive mechanism coupling the platen to the chamber housing such that in operation the single mechanical drive mechanism separates the platen from the chamber housing for loading the semiconductor substrate and further such that in operation the said single mechanical drive mechanism causes the second sealing surface of the platen and the first sealing surface of the chamber housing to contact, thus forming the wafer cavity; [[and]]
- d. a mechanical clamp coupled to the chamber housing and the platen such that in operation the mechanical clamp maintains the wafer cavity during high pressure processing; and
- e. a circulation loop coupled to the wafer cavity and configured to maintain a supercritical fluid and circulate the supercritical fluid through the wafer cavity.

Claim 14 (currently amended): A high pressure chamber for processing of a semiconductor substrate comprising:

- a. a chamber housing;
- b. a platen comprising a region for holding the semiconductor substrate;
- c. a single mechanical drive mechanism having a single pressure source for forming and maintaining a wafer cavity for containing the semiconductor substrate during high pressure processing, the single mechanical drive mechanism coupling the platen to the chamber housing such that in operation the single mechanical drive mechanism separates the platen from the chamber housing for loading of the semiconductor substrate; [[and]]
- d. means for sealing coupled to the chamber housing such that in operation the said single pressure source causes the means for sealing, the platen, and the chamber housing to form the wafer cavity and maintain the wafer cavity during high pressure processing; and
- e. means for maintaining a supercritical fluid and circulating the supercritical fluid through the wafer cavity.

Claim 15 (currently amended): An apparatus for high pressure processing of a semiconductor substrate comprising:

- a. a pressure chamber frame;
- b. a single piston coupled to the pressure chamber frame and comprising a piston body and a piston neck, the pressure chamber frame and the piston body forming a first fluid cavity;
- c. a sealing plate coupled to the pressure chamber frame, the sealing plate in conjunction with the pressure chamber frame, the piston body, and the piston neck forming a second fluid cavity;
- d. a platen coupled to the piston neck, the platen comprising a region for holding the semiconductor substrate and a first sealing surface; [[and]]
- e. a top lid coupled to the pressure chamber frame and comprising a second sealing surface, the first sealing surface of the platen and the second sealing surface of the top lid configured such that in operation the said piston body can be moved using a single pressure within the first fluid cavity so that the first and second sealing surfaces contact to form a wafer cavity and to maintain the wafer cavity during high pressure processing, and in further operation the piston body can be moved so that the first and second sealing surfaces do not contact, thereby allowing the semiconductor substrate to be loaded into and unloaded from the pressure chamber frame; and
- f. a circulation loop coupled to the wafer cavity and configured to maintain a supercritical fluid and circulate the supercritical fluid through the wafer cavity.

Claim 16 (currently amended): The apparatus of claim 15 wherein the first sealing surface and the second sealing surface are configured to form the [[a]] wafer cavity and to maintain the wafer cavity with a supercritical environment therein.

Claim 17 (currently amended): The apparatus of claim 15 wherein the first sealing surface and the second sealing surface are configured to form the [[a]] wafer cavity and to maintain the wafer cavity with a non-supercritical environment therein.

Claim 18 (new): The high pressure chamber of claim 6, wherein the spacer contains a plurality of injection nozzles coupling the wafer cavity to a supply vessel.

Claim 19 (new): The high pressure chamber of claim 18, wherein the spacer further contains a plenum coupled to the plurality of injection nozzles, the plenum having a width larger than a width of the plurality of injection nozzles.

Claim 20 (new): The high pressure-processing chamber of claim 19, wherein a ratio of the width of the plenum to the width of the plurality of injection nozzles is at least 3:1.

Claim 21 (new): The high pressure processing chamber of claim 19, further comprising a supercritical condition generator coupled to the plenum, the supercritical condition generator comprising a heater coupled to a fluid supply.

Claim 22 (new): The high pressure processing chamber of claim 1, further comprising a pump and a filter coupled to the circulation loop.